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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 15524/WO/02		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IL03/01112	International filing date (day/month/year) 29 December 2003 (29.12.2003)	Priority date (day/month/year) 02 January 2003 (02.01.2003)	
International Patent Classification (IPC) or national classification and IPC IPC(7): C25C 1/00; B01B 17/06 and US Cl.: 204/157.15; 210/748			
Applicant YISSUM RESEARCH DEVELOPMENT COMPANY OF THE HEBREW			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>2</u> sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of report with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 21 July 2004 (21.07.2004)		Date of completion of this report 18 March 2005 (18.03.2005)	
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer Edna Wong Jean Proctor Paralegal Specialist Telephone No. (572) 272-1700	

Form PCT/IPEA/409 (cover sheet)(July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/IL03/01112

I. Basis of the report

1. With regard to the elements of the international application:*

☐

the international application as originally filed.

☒

the description:

pages 1-10, as originally filedpages NONE, filed with the demandpages NONE, filed with the letter of _____.☒

the claims:

pages NONE, as originally filedpages NONE, as amended (together with any statement) under Article 19pages NONE, filed with the demandpages 11 and 12, filed with the letter of 09 November 2004 (09.11.2004)☒

the drawings:

pages 1-3, as originally filedpages NONE, filed with the demandpages NONE, filed with the letter of _____.☐

the sequence listing part of the description:

pages NONE, as originally filedpages NONE, filed with the demandpages NONE, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐

the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐

the language of publication of the international application (under Rule 48.3(b)).

☐

the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐

contained in the international application in printed form.

☐

filed together with the international application in computer readable form.

☐

furnished subsequently to this Authority in written form.

☐

furnished subsequently to this Authority in computer readable form.

☐

The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐

The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:☐the description, pages NONE☐the claims, Nos. NONE☐the drawings, sheets/fig NONE5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/IL03/01112**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. STATEMENT**

Novelty (N)	Claims <u>1-18</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-18</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-18</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Claims 1-18 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a method for enhancing the generation of hydroxyl radicals (OH[•]) in aqueous mixtures containing hydrogen peroxide, comprising the steps of (i) supplying, (ii) supplying, (iii) irradiating and (iv) mixing as presently claimed, esp., the step of (i) supplying oxygen to said mixture.

Grey's teaching that oxygen may provide peroxide, would not have enabled a skilled person to come to the reactant combination of the present invention, namely $\text{H}_2\text{O}_2 + \text{O}_2 + \text{MgO} + \text{UV}$ because there is no reason for a skilled person not to increase the initial concentration of H_2O_2 instead of adding O_2 and converting it into more H_2O .

Claims 1-18 meet the criteria set out in PCT Article 33(4) and thus have industrial applicability because the subject matter claimed can be made or used in industry.

----- NEW CITATIONS -----

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CLAIMS

1. A method for enhancing the generation of hydroxyl radicals (OH*) in aqueous mixtures containing hydrogen peroxide, comprising
 - i) supplying oxygen to said mixture;
 - ii) supplying magnesium oxide to said mixture as a catalyst;
 - iii) irradiating said mixture with UV light; and
 - iv) mixing said mixture.
2. The method of claim 1, wherein the aqueous mixture is an aqueous solution or suspension.
3. The method of claim 1, wherein the hydrogen peroxide has an initial concentration of from 2 to 250 ppm.
4. The method of claim 1, wherein the oxygen is supplied by injecting of air or oxygen into the mixture.
5. The method of claim 1, wherein the oxygen is supplied to saturation.
6. The method of claim 1, wherein said UV radiation has wavelength of from 190 to 390 nm.
7. The method of claim 1, wherein the magnesium oxide is added to the mixture to a concentration of from 2 ppm to 250 ppm.
8. The method of any one of claims 1 to 7, wherein the initial concentration of hydrogen peroxide is from 10 to 50 ppm, and the initial concentration of magnesium oxide is from 10 to 50 ppm.

AMENDED SHEET

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~~11~~

9. The method of any one of claims 1 to 8, wherein the pH of said mixture has a value of from 5 to 10.
10. The method of claim 9, wherein said pH has a value of 7.2 to 9.7.
11. The method of claim 1, wherein said mixing is carried out for a period of time sufficient to generate the desired amount ~~or~~ of radicals.
12. The method of claim 11, wherein said desired amount of radicals is an amount sufficient to reach a required biocidal effect in the mixture.
13. The method of claim 11, wherein said period lasts from 3 seconds to 5 hours.
14. The method of claim 13, wherein said period lasts from 30 second to 100 minutes.
15. The method of claim 11, wherein said period lasts more than 5 hours.
16. The method of claim 11, wherein said desired amount of radicals is a predetermined quantity.
17. The method of claim 11, wherein generated radicals are quantified by a physical or chemical method.
18. The method of claim 17, wherein said chemical method comprises reacting the hydroxyl radicals with salicylic acid.

AMENDED SHEET